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**THE EMPLOYMENT EXPERIENCE  
OF THE UNEMPLOYED**  
Graham Glenday and  
Glenn P. Jenkins  
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**BOUR MARKET DEVELOPMENT TASK FORCE  
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This is one in a series of technical studies prepared for the Task Force on Labour Market Development. The opinions expressed are those of the author and do not necessarily reflect those of the Task Force. They do not reflect the views of the Government of Canada.



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## ABSTRACT

### THE EMPLOYMENT EXPERIENCE OF THE UNEMPLOYED

Graham Glenday and Glenn P. Jenkins

This study examines the employment experience of workers in Canada who were unemployed at some point during the period 1972 through 1979. The employment-unemployment experience of workers over this eight-year period was derived from a data base constructed from the one-in-ten sample of the administrative records kept by the Department of Employment and Immigration concerning Unemployment Insurance (UI) claims, Records of Employment and certain income tax records of individuals in Canada. From this data a history of the employment experience of individuals during the time they were in the labour force is constructed.

It is found that the unemployed in Canada have spent a wide range of their total labour force time employed but that overall 75 per cent of the individuals have worked at least 50 per cent of the time, with 50 per cent working over 70 per cent of the time. In the slow-growth regions of the country the proportion of time the unemployed spend employed is smaller and the proportion of the labour force experiencing unemployment is substantially larger than that in high-growth regions.

Although older workers tend to spend more time working, age appears to be a much more significant factor in determining if a person is going to work more than 90 per cent of the time than it affects the decision of whether or not a person is going to work more or less time if they are in the 0 to 60 per cent range.



The results of this study indicate that the proportion of time an unemployed person has spent working is not significantly affected by the sex of the individual. At the same time those people who worked less than 30 per cent of the time tend to be employed in relatively low-skilled jobs. For the entire sample of the unemployed the average index of skill required by the jobs they held was .951. However, for those employed less than 30 per cent of the time the index was 1.44.

Seasonality of the jobs undertaken by individuals has a high negative relationship to the amount of time they are employed. For those working less than 30 per cent of the time over 46 per cent of the jobs they had were seasonal while for those working over 90 per cent of their time less than 20 per cent of their jobs were seasonal.

It was found that people who worked less than 30 per cent of the time, while on average no younger than those working 30 to 90 per cent of the time, tended to have spent an average of about one year less in the labour force. These individuals experienced significantly longer average durations of unemployment than those working over 60 per cent of the time, however, in explaining the proportion of time they are employed we find that of greater importance is the difference in their average duration of employment. The median duration of employment is approximately 4.5 times as great for people who work over 90 per cent of the time compared with those who work less than 30 per cent of the time.


When several of these factors are taken together and used to explain the proportion of time individuals are unemployed and employed we find that age, skill, seasonality of the industry of employment and wage rates are



statistically significant at a high level of confidence. However, taken together they still explain only a small fraction of the behaviour of the unemployed.

The principal conclusion that can be drawn from these results is that employment policies that target on unemployed individuals with specific socioeconomic characteristics are unlikely to be significant in reducing the overall level of unemployment in Canada. Even if we were to take nine common socioeconomic variables together and target a program according to them it is unlikely that they would identify those workers suffering the greatest amount of unemployment. In general we find that the characteristics of employment, such as the permanency of the job (duration of employment spell), the skill requirements of the job, the wages paid by the job and the seasonality of the industry, are of greater importance in determining the amount of unemployment experienced than are the characteristics of the individual (e.g., age, sex, dependency status) or the variability of the individual's average duration of unemployment.

These results would tend to point designers of employment policies away from the construction of targeted employment programs and towards those general incentives and pricing policies that would discourage people from choosing to be unemployed. At the same time policies should be designed to encourage the creation of jobs that offer long duration of employment and to discourage the proliferation of seasonal, low-skilled and low-paying jobs that tend to coexist with large amounts of unemployed time.



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## SOMMAIRE

### LE VÉCU DU TRAVAIL DES CHÔMEURS

Graham Glenday et Glenn P. Jenkins

Dans cette étude, nous examinons le vécu du travail des personnes qui ont été en chômage à un moment donné au cours de la période de 1972 à 1979. Le vécu du travail et du chômage des travailleurs canadiens au cours de cette période de huit ans a été établi au moyen d'une base de données comprenant un échantillon des dossiers administratifs (1 sur 10) du ministère de l'Emploi et de l'Immigration concernant les demandes d'assurance-chômage, les relevés d'emplois et certains dossiers d'impôt de particuliers au Canada. A l'aide de ces données, nous avons tracé un tableau du vécu du travail des particuliers au cours de la période pendant laquelle ils étaient sur le marché du travail.

Nous constatons que les chômeurs au Canada ont été effectivement employés pendant une bonne partie de la durée totale où ils étaient sur le marché du travail, mais qu'en général 75 % d'entre eux avaient travaillé 50 % du temps au moins et de ce nombre 50 % avaient travaillé plus de 70 % du temps. Dans les régions à croissance lente, la proportion de temps pendant laquelle les chômeurs sont employés est plus faible que dans les régions à forte croissance, mais aussi la proportion de la population active touchée par le chômage y est beaucoup plus importante.

Même si les travailleurs plus âgés ont tendance à consacrer plus de temps au travail, l'âge semble être un facteur beaucoup plus important pour déterminer si une personne travaillera plus de 90 % du temps qu'il ne l'est quant à la décision de cette personne de consacrer plus ou moins de temps au travail lorsqu'elle se situe dans les 0 à 60 %.

Les résultats de l'étude montre que le sexe du chômeur influe peu sur la proportion de temps qu'il consacrera au travail. Les personnes qui travaillent moins de 30 % du temps ont tendance à occuper des emplois assez peu spécialisés. Pour l'échantillon complet de chômeurs, l'indice moyen de compétence qu'exigent les emplois exercés était de 0,951. Cependant, dans le cas des personnes qui travaillent moins de 30 % du temps, l'indice se situait à 1,44. Le caractère saisonnier des emplois qu'occupent les particuliers présente un lien négatif étroit avec la durée de l'emploi. Dans le cas des personnes qui travaillent moins de 30 % du temps, plus de 46 % des emplois étaient saisonniers alors que chez ceux travaillant plus de 90 % du temps, moins de 20 % des emplois présentaient cette caractéristique. Nous avons constaté que les personnes qui ont travaillé moins de 30 % du temps avaient été sur le marché du travail une année de moins environ, même si, en moyenne, elles n'étaient pas plus jeunes que celles qui travaillaient de 30 à 90 % du temps. Ces personnes étaient en moyenne beaucoup plus longtemps en chômage que celles qui travaillaient plus de 60 % du temps. Cependant, en examinant de plus près la proportion du temps où elles étaient employées, nous constatons que la différence au niveau de leur durée moyenne d'emploi revêt une plus grande importance. La durée médiane de l'emploi est à peu près 4,5 fois plus grande chez les personnes qui travaillent plus de 90 % du temps, que chez celles qui travaillent moins de 30 % du temps.

Lorsque plusieurs de ces facteurs sont conjugués et utilisés pour expliquer la proportion du temps pendant lequel les particuliers sont en chômage ou travaillent, nous constatons que l'âge, les compétences, le caractère saisonnier de l'industrie et le taux de rémunération revêtent une grande importance sur le plan statistique et ce, avec un haut niveau de fiabilité. Cependant, pris dans leur ensemble, ces facteurs n'expliquent qu'un côté bien infime du comportement des chômeurs.



La principale conclusion qu'on puisse tirer de ces résultats est que les politiques en matière d'emploi, lorsqu'elles visent précisément les chômeurs qui témoignent de certaines caractéristiques socio-économiques, ont peu de chances de réduire sensiblement le niveau global du chômage au Canada. Même si nous prenions neuf variables socio-économiques courantes et que nous élaborions un programme inspiré de ces caractéristiques, il est peu probable qu'elles permettraient de repérer les travailleurs qui sont le plus touchés par le chômage. En général, nous constatons que les caractéristiques de l'emploi, telles que le caractère permanent de l'emploi (durée de la période d'emploi), les compétences requises, le salaire et le caractère saisonnier de l'industrie sont plus importantes pour déterminer le chômage vécu que les caractéristiques de l'individu (c.-à-d. son âge, son sexe, ses charges de famille) ou la variabilité de la durée moyenne du chômage de la personne.

Ces résultats devraient amener les concepteurs des politiques d'emploi à s'éloigner des programmes d'emploi qui visent des groupes particuliers pour s'orienter vers des politiques générales de motivation et de prix qui décourageront les travailleurs d'opter pour le chômage. Dans un même temps, les politiques devraient être conçues pour encourager la création d'emplois de plus longue durée et pour décourager la prolifération des emplois saisonniers, peu spécialisés et faiblement rémunérés qui ont tendance à favoriser de longues périodes de chômage.





## THE EMPLOYMENT EXPERIENCE OF THE UNEMPLOYED

### I. INTRODUCTION

In previous studies of unemployment, considerable effort has been made to identify and estimate the effect of various socio-economic characteristics of the unemployed on both labour market turnover and the duration of unemployment.<sup>1</sup> The emphasis of this paper is somewhat different in that it deals primarily with the nature of the employment experience of those who have become unemployed. More specifically, this paper focuses on the distribution of the proportions of time spent employed by these individuals.<sup>2</sup>

This effort will examine the unemployment - employment experience of individuals in Canada for up to an 8-year time span (1972-79). For people who have first entered the labour force since 1972, our information covers their unemployment-employment experience since the date they obtained their first job. Using the administrative records of the Unemployment Insurance Commission (UIC) and the records of employment (ROE) employers must file whenever a worker is separated (even temporarily) from a firm, a weekly profile is developed of the labour market experience for each individual who has made one or more claims from the UIC system since 1972 and been unemployed at least once since 1974. This weekly record extends from January 1972 to January 1980 and tells us if a person is in or out of the labour force, employed or unemployed. If a person is unemployed, it tells us whether or not the person is collecting UIC benefits. Certain items of information from income tax records on wages and salaries (T-4 form information) have also been merged into the UIC-ROE data files to assist in completing the employment histories of this sample of workers.

Using this information, we are able to estimate the proportion of labour force time that individuals spent working. The distribution of this variable is then compared across regions in Canada. Within each distribution, we then investigate the socio-economic characteristics of the individuals and the jobs they work at for those who are employed different proportions of their labour force time. The determinants of the proportion of time employed is analyzed further through a study of the durations of unemployment and employment experienced by individuals. Finally, an estimation is carried out to determine how well a number of common socio-economic variables used to target employment programs serve to predict the unemployment-employment behaviour of individuals who have experienced some unemployment.

## II. THE WORK EXPERIENCE OF THE UNEMPLOYED

From the UIC-ROE data files, we are able to identify when people leave a job and start their next one. In addition, when they leave a job, we know when they started working for that particular employer. Hence, for those who experienced unemployment from 1974 through 1979, we are able to estimate the proportion of labour force time they are employed from 1972 through the end of 1979. Our criterion for determining when a person is out of the force is much more restrictive than the one used by Statistics Canada for its labour force survey. For the UIC-ROE data base, an individual is classified as being out of the labour force only if the person notified the UIC that for reasons such as sickness, schooling, maternity leave and retirement, they were not available for work. Alternatively, if in our examination of the person's labour force experience we find that he quit a job, did not find subsequent employment for an extended period, was eligible to collect UIC benefits but did not make a claim, then we classified this individual as being out of the labour force. Hence, for each individual we construct an employment index (EMIND) as follows:



(1) EMIND = (Total number of weeks individual employed during period)/(Total number of weeks in labour force during period).

In Table 1, column 1, the distribution of the individuals in Canada who experienced some unemployment during 1974-79 is shown according to the proportion of their total labour force time they were employed (EMIND). An examination of 19 regional labour markets in Canada indicated that two major labour market regions which appear to have a wide difference in employment experience are Newfoundland and Toronto, and hence, are used in this paper to illustrate the range of experience across regions. The distribution for these two regions are also shown in Table 1, in columns 2 and 3. Figure 1 also illustrates the distribution of the proportion of time employed for workers who experienced unemployment in these two regions and in all of Canada.

For Canada as a whole, the employment experience of those experiencing some unemployment is far from uniform. This distribution, however, is skewed so that approximately 74 percent of these individuals have worked over 50 percent of the time they have been in the labour force, and about 48 percent have worked over 70 percent of the time. In Newfoundland, approximately 55 percent of the unemployed have been working at least 50 percent of the time with about 27 percent of the people working more than 70 percent of the time. As a contrast, 80 percent of those unemployed in Toronto have worked over 50 percent of the time while about 58 percent of the individual worked over 70 percent of the time they were in the labour force.

TABLE 1

PROPORTION OF TIME EMPLOYED 1972-79 FOR  
INDIVIDUALS WHO HAVE EXPERIENCED SOME  
UNEMPLOYMENT DURING 1974-79

PROPORTION OF TOTAL LABOUR FORCE TIME (1972-1979) SPENT EMPLOYED	PERCENTAGE OF ALL INDIVIDUALS EXPERIENCING SOME UNEMPLOYMENT		
	CANADA (1)	NEWFOUNDLAND (2)	TORONTO (3)
0-.10	.3	.6	.1
.11-.20	1.8	4.6	1.4
.21-.30	4.6	10.2	3.5
.31-.40	8.2	15.0	5.6
.41-.50	11.2	14.8	9.3
.51-.60	12.0	15.7	9.7
.61-.70	13.7	12.3	12.6
.71-.80	13.9	8.8	14.2
.81-.90	14.7	8.5	17.4
.91-1.00	19.7	9.5	26.3
PERCENTAGE OF LABOUR FORCE IN REGION AS OF 1979 WHO EXPERIENCED SOME UNEMPLOYMENT DURING 1974-1979	58	76	49



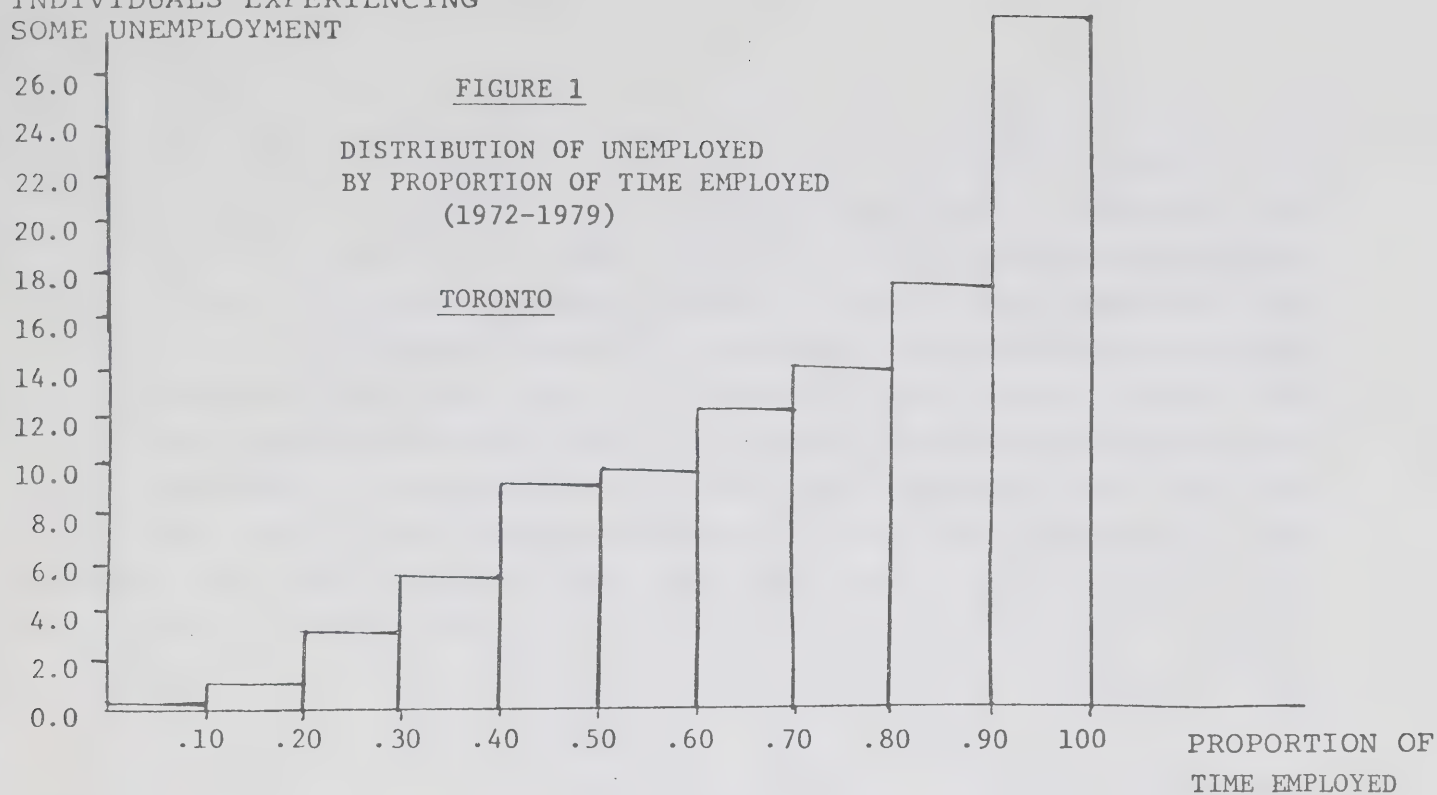
PERCENTAGE OF ALL  
INDIVIDUALS EXPERIENCING  
SOME UNEMPLOYMENT

- 5 -

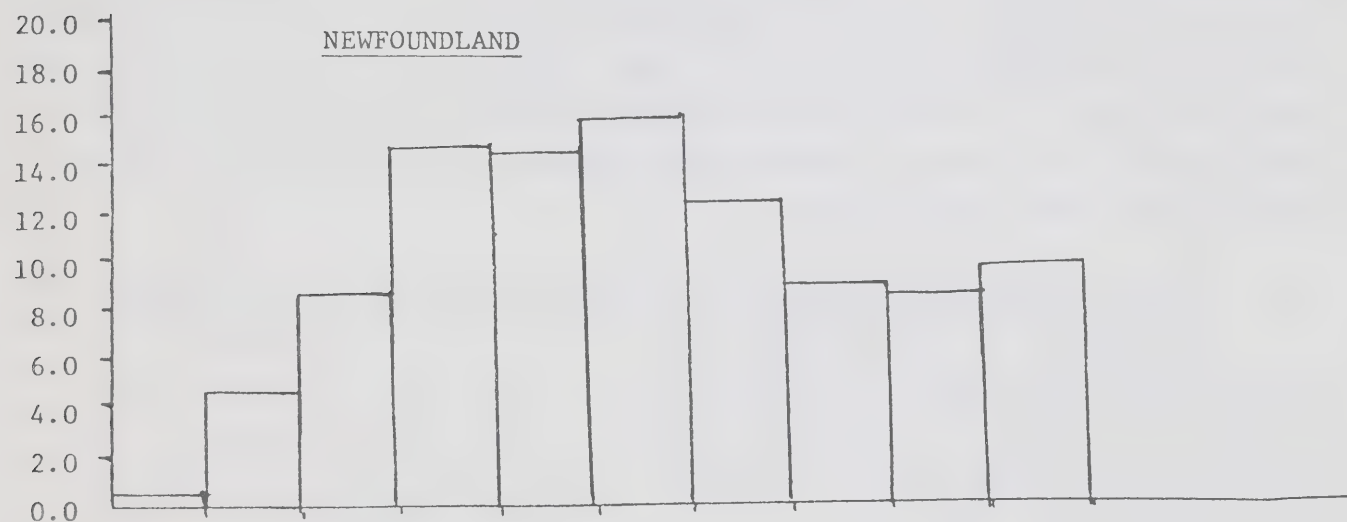
FIGURE 1

DISTRIBUTION OF UNEMPLOYED  
BY PROPORTION OF TIME EMPLOYED  
(1972-1979)

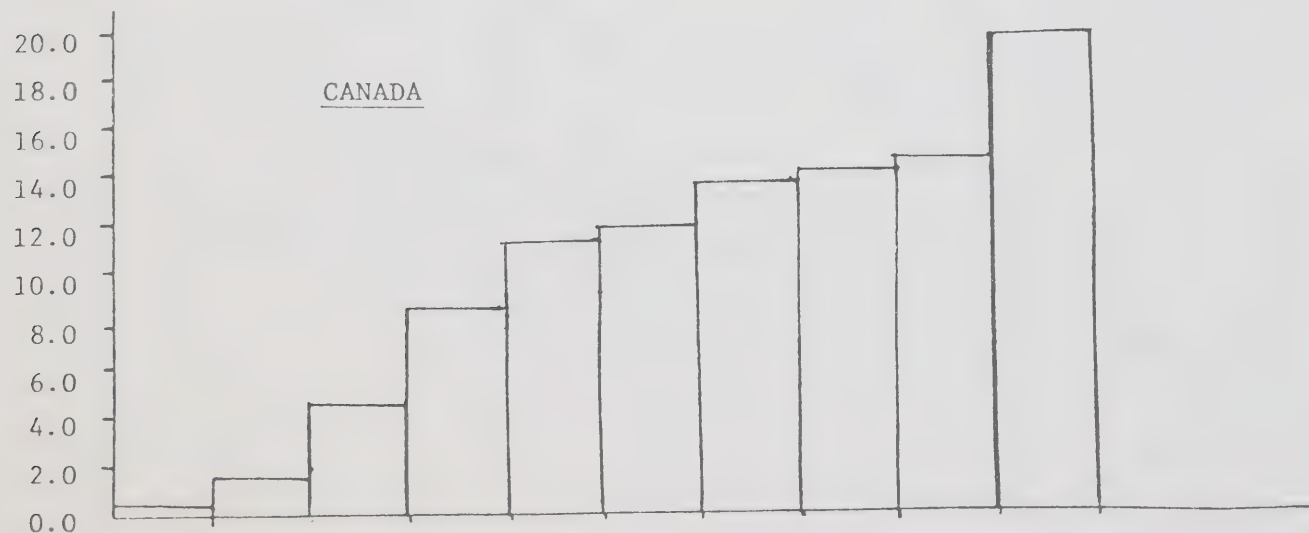
TORONTO



NEWFOUNDLAND



CANADA



From Figure 1, we can see that the principal difference between the employment experience of those who have been unemployed in Toronto and Newfoundland (which is similar to areas such as N.E. New Brunswick, Cape Breton Island and Shawinigan) is that in the latter, more people are employed a smaller proportion of the time with a very significant reduction in the fraction of people employed between 90 to 100 percent of the time. In addition, we find that over the 6-year period (1974-79), 76 percent of the people in the labour force as of 1979 became unemployed at least once in Newfoundland while 49 percent of Toronto's labour force experienced some unemployment with the average for all of Canada being 58 percent.

From these results it appears that the higher unemployment rates in the slow growth regions is caused both by the fact that those becoming unemployed tend to work less than their counterparts in the slow growth areas and also because a significantly larger proportion of the labour force in the slow growth regions tend to experience some unemployment.

### III. CHARACTERISTICS OF THE UNEMPLOYED BY DEGREE OF EMPLOYMENT

From Table 1 and Figure 1, it is clear that within a labour market there is a wide range of employment experience among those who have become unemployed. To gain a better understanding of the characteristics of those who experience hardship from unemployment, we have grouped all the individuals experiencing unemployment into categories according to the proportion of total labour force time these individuals are employed. Four categories were chosen: namely, those employed 30 percent and less of time while in the labour force, those employed between 31 and 60 percent of their time, those employed between 61 and 90 percent, and those employed over 90 percent of time.

In Table 2, the mean age as of the date of losing their last job before 1980, for those employed for various proportions of time, are presented for all of Canada and seven selected regions across Canada. The surprising result from Table 2 is that the mean age of the group of people who work less than 30 percent of the time (32.6 years) is virtually identical to the groups who work between 31 and 90 percent of the time. A priori one would have thought that the low employment group would be heavily dominated by the youth. Although the way in which the UIC-ROE data base has been constructed, excludes those who have never collected UI benefits at any time, one would have thought that the rather short 10 to 14 week employment requirement before a person can collect UI benefits would not have eliminated young workers who were seriously in the labour force from our sample.<sup>4</sup>

TABLE 2

AGE AND THE PROPORTION OF  
TIME EMPLOYED

REGION	All UNEMPLOYED	PROPORTION OF TIME EMPLOYED			
		0 to .3	.31 to .60	.61 to .90	.91 to 1.00
CANADA	33.9	32.6	32.8	33.5	36.8
NEWFOUNDLAND	32.7	33.7	32.9	31.0	35.6
N.E. NEW BRUNSWICK	33.5	32.4	33.6	33.5	35.9
HALIFAX	33.8	31.8	33.2	33.4	36.5
MONTREAL	34.4	33.2	34.2	33.5	37.5
TORONTO	35.2	34.7	33.6	34.7	37.6
WINNIPEG	34.2	33.3	34.5	32.8	37.1
VANCOUVER	34.0	34.7	33.3	33.0	36.8



It is clear that those workers who are employed over 90 percent of the time tend to be on average 2 to 4 years older than the rest of the unemployed. However, to explain the reason why certain individuals have a very loose attachment to employment (i.e., employed less than 30 percent of the time), we will have to examine other characteristics of these individuals.

An explanatory variable, often thought to be important in determining unemployment behaviour, is the sex of the individual. In Table 3, we find that for all of Canada, the group of individuals who have been unemployed is made up of 57 percent males while the labour force as a whole is 61 percent male. After subdividing the unemployed into categories reflecting their employment experience, we find that the group working less than 30 percent of the time tends to be made up of slightly fewer males than is the average for all the unemployed. This relationship does not hold up for all regions reported in Table 3. We find that in all regions, except Toronto, the group that work less than 30 percent of the time tend to have 3 to 7 percent more females than for the unemployed in general and from 5 to 15 percent more females than their overall representation in the labour force. In many regions, there has been a tendency for there to be more than the average number of women in the category of workers being employed more than 90 percent of the time. This is not the case, however, for Canada as a whole where the average number of women in this high employment category is approximately the same as for all the unemployed in Canada taken together.

The UIC-ROE data base also enables us to evaluate the skill level required to do the jobs that these people held when they were not unemployed. An index of the skill required to do each job (SYP) was developed by matching up the 4-digit occupation code provided, derived from each record of employment with the years of special vocational preparation estimated by the Department of Employment and Immigration to be necessary to perform such a job.<sup>5</sup> Table 4 contains the values of the average skill requirements (SYP) on the jobs performed by people with different levels of EMIND.

TABLE 3

SEX AND THE PROPORTION  
OF TIME EMPLOYED  
(Proportion of workers that are male)

REGION	(1)	(2)	(3)	(4)	(5)	(6)
	ALL LABOUR FORCE	ALL UNEMPLOYED	PROPORTION OF TIME EMPLOYED			
			0 to .3	.31 to .60	.61 to .90	.91 to 1.00
CANADA	.61	.57	.52	.58	.57	.58
NEWFOUNDLAND	.69	.66	.63	.70	.65	.60
N.E. NEW BRUNSWICK	.63	.65	.58	.67	.69	.56
HALIFAX	.61	.57	.50	.58	.60	.50
MONTREAL	.63	.55	.48	.56	.55	.55
TORONTO	.59	.55	.62	.59	.55	.52
WINNIPEG	.59	.56	.49	.62	.54	.52
VANCOUVER	.61	.60	.54	.60	.59	.63

TABLE 4  
OCCUPATIONAL SKILL AND THE  
PROPORTION OF TIME EMPLOYED

(Years of specific vocational preparation, SVP)

REGION	(1)	(2)	(3)	(4)	(5)
	ALL UNEMPLOYED	0 to .30	PROPORTION OF TIME EMPLOYED		
			.31 to .60	.61 to .90	.91 to 1.00
CANADA	.91	.56	.73	.98	1.20
NEWFOUNDLAND	.66	.35	.46	.88	1.42
N.E. NEW BRUNSWICK	.72	.46	.62	.95	1.21
HALIFAX	1.11	.82	.92	1.17	1.40
MONTREAL	1.01	.65	.91	1.01	1.36
TORONTO	1.05	1.30	.76	1.13	1.18
OSHAWA	.71	.36	.57	.75	.89
WINNIPEG	.96	.91	.73	.95	1.29
VANCOUVER	1.06	.58	.88	1.11	1.42

From Table 4, we find that the skill level of the jobs found by workers continuously increases with the proportion of time the worker is employed. On average, the index of skill for the jobs found by workers employed less than 30 percent of the time is only 47 percent of those found in people who work over 90 percent of the time. Except for Toronto and Winnipeg, the skill level of those working less than 30 percent of the time is lowest of all categories. In Toronto, we find a surprising result that those who work least have the highest average level of skills. A more detailed examination of the Toronto sample indicated that this result occurs because a minority of very highly skilled managerial and professional workers have only worked a small fraction of their labour force time while living in Toronto. In general, we found that the skill levels of the workers employed less than 90 percent of the time in the slow growth areas (Newfoundland and N.E. New Brunswick) are substantially below the skill level of the jobs found by their counterparts in the faster growing urban areas. The one important exception, reported in Table 4, is the Oshawa region (which is similar to Windsor but which is not reported). This region is heavily dominated by the automotive industry. There we find that the unemployed, generally, have very low skill level jobs comparable to these found in Newfoundland and N.E. New Brunswick. While the automobile sector tends to provide higher than average wages, the jobs it provides tend to be below average in their skill requirements.

In the Canadian context, we would expect to find that those who work only a small fraction of the year would be more heavily employed in the seasonal industries than those who work a higher fraction. To measure the degree that people are employed in seasonal industries, we estimated the ratio of the number of jobs an individual has had in a seasonal industry (defined here as construction, forestry, fishing, mining, agriculture and tourism) to the total number of jobs the person has had over the period 1974 through 1979.



TABLE 5  
SEASONALITY AND THE PROPORTION  
OF TIME EMPLOYED  
(Proportion of jobs in seasonal industries)

REGION	ALL	PROPORTION OF TIME EMPLOYED			
	UNEMPLOYED	0.0 to	.31 to	.61 to	.91 to
		.30	.60	.90	1.00
	(1)	(2)	(3)	(4)	(5)
CANADA	.32	.41	.38	.31	.22
NEWFOUNDLAND	.61	.71	.70	.50	.39
N.E. NEW BRUNSWICK	.62	.70	.69	.52	.33
HALIFAX	.35	.40	.39	.38	.20
MONTREAL	.20	.22	.23	.21	.12
TORONTO	.21	.28	.25	.22	.15
WINNIPEG	.32	.34	.40	.33	.20
VANCOUVER	.38	.48	.44	.36	.30

In Table 5 we find that while 32 percent of all jobs lost by the unemployed were in the sectors that tend to be seasonal, 41 percent of the jobs held by people who worked less than 30 percent of the time were seasonal. For those working over 90 percent of the time only 22 percent of the jobs lost were in the seasonal sectors. This general pattern is quite consistent across regions with those employed less than 30 percent of the time working for seasonal activities about twice as frequently as those working over 90 percent of the time. Regions such as Toronto and Montreal have substantially less employment in activities affected by seasonal fluctuations than do the slow growth areas and some other urban areas such as Vancouver, Halifax, Winnipeg, Calgary (.46), and Saskatoon (.42)

Another variable that is related to the age of the workers but may have an independent effect on the proportion of time employed is the number of weeks the individual has been in the labour force over the past eight years. For Canada as a whole, we find that those experiencing some unemployment have been in the labour force on average 353.8 weeks out of a potential maximum of 418 weeks. Those working less than 30 percent of the time were in the labour force less than average (296.3 weeks). On the other hand, those working from 30 to 60 percent and from 60 to 90 percent were in the labour force 335.8 and 360.6 weeks, respectively, and those working over 90 percent of the time were in the labour force 387.4 weeks.

#### IV. DURATION OF EMPLOYMENT AND UNEMPLOYMENT

The proportion of time employed, EMIND, was previously defined as the number of weeks a worker has been employed over the past 8 years divided by the number of weeks he has been in the labour force. In Figure 2, where  $E_i$  refers to weeks of employment in a spell,  $U_i$  refers to weeks of unemployment in a spell, and  $NLF_i$  refers to the weeks in a spell out of the labour force, the EMIND for an individual with three spells of unemployment and employment can be estimated as:

$$(2) \text{ EMIND} = (E_1 + E_2 + E_3) / ((E_1 + E_2 + E_3) + (U_1 + U_2 + U_3))$$

An alternative approach that adds more to our understanding of the determinants of the unemployment-employment relationship is to express EMIND as the ratio of the average duration of employment for an individual (AVDURE) to the sum of the person's AVDURE and his average duration of unemployment (AVDURU). Hence, EMIND can also be expressed as:

$$(3) \text{ EMIND} = \text{AVDURE}^k / (\text{AVDURE}^k + \text{AVDURU}^k),$$

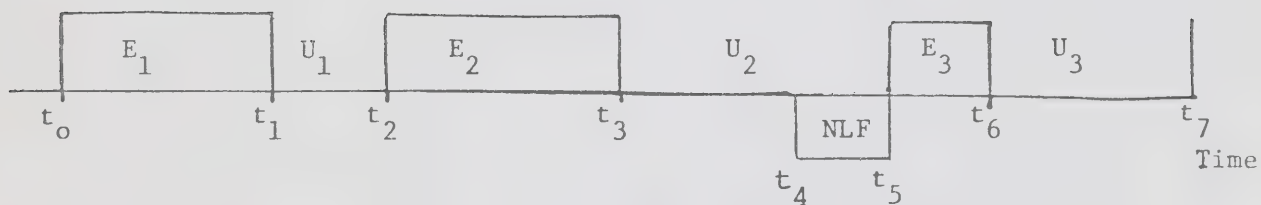
$$\text{where } \text{AVDURE}^k = \sum_{i=1}^N E_i^k / N$$

$$\text{and } \text{AVDURU}^k = \sum_{i=1}^N U_i^k / N$$

for the kth individual.

FIGURE 2

PROFILE OF INDIVIDUAL  
EMPLOYMENT - UNEMPLOYMENT





The values of AVDURE and AVDURU were estimated for each of the individuals in the Canada-wide sample based on completed spells during the period 1972 through 1979 and classified according to the range in which the individual's overall value of EMIND fell. We then estimated the mean of the AVDURU's and AVDURE's for the groups of workers who had values of EMIND between 0 and .3, between .3 and .6, between .6 and .9 and for those with values of EMIND above .9. The results of these estimates are presented in rows 1 and 2 of Table 6 along with their standard deviations. In Table 6, rows 3 and 4, we also present estimates of the median length of unemployment (WKSUN) spell and the median length of employment (WKRSEM) for all the spells of the individuals who fell within each of these ranges of EMIND. Finally, in row 5, the average turnover rate (UNIND), expressed as the number of unemployment spells of at least one week per year in the labour force over the 1972-79 period, is given for individuals in each EMIND group.

TABLE 6

DURATION OF EMPLOYMENT AND UNEMPLOYMENT BY  
PROPORTION OF TIME EMPLOYED IN CANADA  
(Weeks)

VARIABLE	ALL UNEMPLOYED	PROPORTION OF TIME EMPLOYED			
		0 to .3	.31 to .6	.61 to .9	.91 to 1.0
	(1)	(2)	(3)	(4)	(5)
1. AVDURU (mean) (standard deviation)	19.6 (15.0)	32.7 (17.3)	24.8 (15.4)	16.8 (12.5)	6.1 (5.6)
2. AVDURE (mean) (standard deviation)	42.1 (46.9)	17.1 (17.3)	27.2 (24.7)	49.5 (46.6)	107.3 (34.9)
3. WKSUN (median)	4.0	10.6	7.7	3.7	2.8
4. WKSEM (median)	18.1	9.4	13.2	21.8	46.4
5. UNIND (mean)	.69	.76	.92	.73	.31

From Table 6, we obtain the striking results that changes in the average duration of the employment spells experienced by those who become unemployed are an even more important component of the changes in the proportion of time people spend working than are changes in peoples' average duration of unemployment. While the mean of the average duration of unemployment for those working less than 30 percent of the time is 32.7 weeks, the variable falls by less than 50 percent to 16.8 weeks for those working between 60 and 90 percent of the time. At the same time, the mean of the average duration of employment for this group increases by about 3 times from 17.1 to 49.5 weeks. As we move on to the category of workers who are employed, more than 90 percent of the time we find that the mean of the average duration of unemployment falls from 16.8 weeks to 6.1 weeks while the mean of the average duration of employment increased from 49.5 to 107.3 weeks per spell.

An examination of the patterns of the median duration of unemployment and employment for these categories of workers also confirms this result. As we move from workers who work less than 30 percent of the time to those who work more than 90 percent, the median duration of unemployment falls from 10.6 weeks to 2.8 weeks. At the same time, however, we find that the median duration of employment increases from 9.4 weeks per spell of employment to 46.4 weeks.<sup>6</sup>

The turnover rate of workers depends upon the lengths of both employment and unemployment spells. The longer either of these spells becomes, the lower the number of spells of unemployment per year in the labour force. On average, all unemployed in Canada experienced .69 spells of unemployment of at least one week in length per year. The highest turnover rate at .92 is in the group of unemployed working from 30 to 60 percent of the time. The relatively higher increase in the lengths of unemployment than decreases in lengths of employment spells results in a lower turnover rate (.76) for those working less than 30 percent of the time. For those working 60 to 90 percent of the time, the turnover rate

drops to .73 as the average employment durations are relatively higher. The increase in lengths of employment spells has an even stronger impact for those working over 90 percent resulting in a turnover rate of only .31.

Previous studies of unemployment in Canada and elsewhere have tended to concentrate on the factors that effect the duration of unemployment and the general impact of cyclical changes in aggregate demand on turnover. The above results point to the importance of understanding the determinants of the duration of employment experienced by individuals who become unemployed. It would appear that this variable plays a central role in the overall unemployment-employment behaviour members of the labour force and should be key factor in policies designed to reduce unemployment.

V. DETERMINANTS OF THE PROPORTION OF TIME  
EMPLOYED ACROSS INDIVIDUALS

To this point, we have been studying the general relationship between the proportion of labour force time an individual is employed, EMIND, and various socio-economic characteristics of individuals, their jobs and the regions in which they live. We will now attempt to estimate the statistical relationship between the EMIND of individuals and a set of independent variables describing some of the characteristics of individuals and their jobs. The equation estimated is of the following form:

$$\begin{aligned}(4) \quad \text{EMIND} = & C + a_1 \text{SEX} + a_2 \text{AGE} + a_3 \text{AGESQ} + a_4 \text{SVP} \\ & + a_5 \text{WKFL1} + a_6 \text{WKL2} + a_7 \text{WKL3} \\ & + a_8 \text{RSEAS} + a_9 \text{RRECL} + a_{10} \text{MAXW} \\ & + a_{11} \text{DEPST}\end{aligned}$$

where SEX is a dicotomous variable set equal to 1 for males and 0 for females. AGE is the age of the person at the end of 1979,



AGESQ is the square of the individual's age. SYP is the number of years of special vocational training required by the individual to do his last job prior to January 1980. WKLF refers to years in the labour force and is comprised of these dummy variables, WKLF1, WKLF2, and WKLF3. WKLF1 equals 1, if the individual has been in the labour force between 2 and 4 years; WKLF2 equals 1, if the individual has been in the labour force between 4 and 6 years; and WKLF3 equals 1 if the individual has been in the labour force more than 6 years. RSEAS is the proportion of all jobs had by the person over the period 1974-1979 that were in seasonal industries. RRECL is the proportion of all jobs had by an individual that were obtained because the firm rehired or recalled the worker to his previous job. MAXW is a dummy variable that takes on a value of 1, if the worker's last job provided him with a wage above the maximum insured earning for UIC purposes (approximately the average wage in the labour market). MAXW has a value of 0 for all other cases. Finally, DEPST is a dummy variable with a value of 1 for an individual in our sample who has dependents, and 0 otherwise.

There is no economic model that would enable us to have a strong prior judgment as to signs of the coefficients on the independent variables. However, one could hypothesize that because a large fraction of women in the labour force are the second earners in families and have a relatively high opportunity cost in terms of foregone household time that we expect  $(\partial EMIND / \partial SEX) > 0$ . As we would expect younger people to be engaging in more job search, to have less saleable work experience, to have fewer financial responsibilities and to have a lower opportunity cost of time, then we would expect  $(\partial EMIND / \partial AGE) > 0$ . On the other hand, as workers age we would expect that increases in age beyond a point might have less of an effect on the person's employment behavior. Old workers are also expected to be less attractive to new employers if they lose their jobs. Hence, we would expect  $(\partial EMIND / \partial AGESQ) < 0$ .

As the skill required for a job increases, there is an increasing incentive for employers to try to retain workers with these skills, if there is an element of job-specific or firm-specific skills involved. Also, if higher-skilled labour are used with increasing amounts of physical capital in production, then there is an additional incentive to retain workers for a large part of the year to utilize this physical capital stock. Hence, we would expect to find that  $(\partial EMIND / \partial SVP) > 0$ . For many of the same reasons as previously given for expecting a positive coefficient in age as well as firm-specific skills, we would also expect a positive relationship between EMIND and the length of the time in the labour force, WKLF1, and WKLF2, and WKLF3. Because seasonal jobs are relatively short, they provide an opportunity for the workers to take advantage of Canada's generous unemployment insurance benefits and also frequent layoffs would necessitate the worker to engage in more searching for new jobs. For both these reasons, we would expect that  $(\partial EMIND / \partial RSEAS) < 0$ .

The sign on the recall variable is indeterminant. We might hypothesize that relatively short-term layoffs and recalls might dominate this variable, leading us to expect  $(\partial EMIND / \partial RRECL) < 0$ . However, if recalls are associated with seasonal jobs or if recalls are associated with frequent layoffs, then they would tend to increase the proportion of time the workers are unemployed and  $(\partial EMIND / \partial RRECL) > 0$ .

MAXW is a proxy for the wage rate earned by the worker as it takes on a value of 1 when the person earns more than the maximum insured earnings but has a value of 0 at wage rates below this level. We would expect to find that  $(\partial EMIND / \partial MAXW) > 0$  for two reasons. First, if the wage rate is higher, workers will tend to want to increase their supply of labour. Second, higher wage rates tend to be related to level of skill required by the job. As higher-skilled jobs tend to be more stable, this would tend to also cause  $(\partial EMIND / \partial MAXW) > 0$ . However, as equation 4 already

contains a variable measuring the skill of the job, the impact of the wage rate will tend to reflect the response of the supply of labour on the proportion of time the workers are employed.

In Table 7, the OLS estimates of equation (4) are reported. Perhaps the most surprising result of this analysis is that the sex of the workers appears to have a weak impact on EMIND. A male worker is estimated to be employed only 1 percent more than a female, but the coefficient is barely statistically significant. The coefficients on AGE and AGESQ are of the correct sign and significantly different from zero. We find that the combined impact of an increase of age tends to increase EMIND throughout the entire range of ages during which people are expected to be in the labour forces. For example, as a person ages from 30 to 40 years, the expected impact on EMIND is to increase it by nearly 5 percentage points.

The skill level of the job (SVP) is also a significant variable in the explanation of the proportion of time employed across individuals. One additional year of special vocational training tends on average increase the amount of time people work by approximately 1 percent.

The variables denoting the length of time in the labour force WKLF1, WKLF2, and WKLF3 have the correct sign, are statistically significant and are of reasonable size. They indicate that having at least to years of labour force experience increases EMIND by 2.9 to 5.6 percentage points.

Seasonality of jobs RSEAS appears to be a very important variable in determining the level of EMIND for a worker. The size of the coefficient indicates that on average, a job in a seasonal industry is associated with about 9 percent less of the year being spent in employment. Whether or not a worker experiences a high rate of recall, also appears to have a significant impact on the proportion of time people work. Persistent recall lowers EMIND by 4 percentage points.



TABLE 7

DETERMINANTS OF THE PROPORTION OF TIME EMPLOYED (EMIND)

VARIABLE	COEFICIENT	t-STATISTIC
CONSTANT	.23702	
SEX	.01146	1.55
AGE	.01938	12.03
AGESQ	-.00021	-11.26
SVP	.01001	5.01
WKLF1	.02920	1.96
WKLF2	.05635	3.82
WKLF3	.04477	3.03
RSEAS	-.09269	-11.62
RRECL	-.04224	-3.53
MAXW	.05783	7.68
DEPS	.0088	1.17

$\bar{R}^2$	.113
F	54.65
(degrees of freedom)	(11,4622)
Standard error	.2131
Observations	4634

Mean values: EMIND=.6680; SEX=.5691; AGE= 35.52; SVP= .988  
 WKLF1= .2233; WKLF2=.2805; WKLF3=.4396; RSEAS=.3295;  
 RRECL=.2201; MAXW=.4348; DEPST=.2825.

The wage a person earns has a significant positive impact on a person's employment behavior. If a worker is earning above the maximum insurable earnings, it is estimated that he will be working approximately 6 percent more of each year. The fact that a worker has other dependents in his family who are not employed does not appear to have a significant impact on the proportion of time this group are employed.<sup>7</sup>

Although several of the independent variables are statistically significant with coefficients of a realistic size, the overall explanatory power of the equation is relatively weak. The adjusted  $R^2$  is equal to .11, the F statistic is 54.7 (significant at the 99 percent confidence level) and the standard error of the overall equation is .213 as compared to the mean value of the dependent variable of .668. This would lead us toward the conclusion that the targeting programs toward individuals with specific socio-economic characteristics in order to reduce their unemployment might not be very successful. While many of the popular variables for characterizing the unemployed are significant in explaining variations across individuals in the proportion of time they are employed, they do not, even when all taken together, have a very high predictive power in explaining how much of total labour force time a worker will end up spending unemployed and employed.

## VI. SUMMARY AND CONCLUSIONS

In this study, we have examined the employment experience of workers in Canada who have been unemployed at some point during the period 1972 through 1979. The employment-unemployment experience of workers over this eight-year period is derived from a data base constructed from the one-in-ten sample of the administrative records kept by the Department of Employment and Immigration concerning the Unemployment Insurance (U.I.) claims, Records of Employment and certain income tax records over time of individuals in Canada. From this data, we were able to construct a history of the employment experience of individuals during the time they are in the labour force including the socio-economic characteristics of the individuals that exhibit various types of employment behaviour.

A number of important findings come out of the paper. First, we find that the unemployed in Canada have spent a wide range of their total labour force time employed, but overall 74 percent of the individuals have worked at least 50 percent of the time with 48 percent working over 70 percent of the time. It is also found in the slow growth regions that the proportion of time the unemployed spend employed is smaller and the proportion of the labour force experiencing unemployment is substantially larger than in the other normal labour markets. Second, it is found that while older workers tend to spend more time working, age appears to be a much more significant factor in determining if a person is going to work more than 90 percent of the time than it affects the decision of whether or not a person is going to work more or less time if they are in the 0 to 60 percent range.

Third, it is found that the proportion of time an unemployed person has spent working is not significantly affected by the sex of the individual. Fourth, those people who worked less than 30 percent of the time tended to be employed in relatively low-skill-ed jobs. For the entire sample of unemployed, the average index of skill required by the jobs they were employed in was .91. However, for those employed less than 30 percent of the time, the index was .56 compared to 1.20 for those employed over 90 percent. Fifth, the seasonality of the jobs undertaken by these individuals has a high negative relationship with the amount of time people are employed. For those working less than 30 percent of the time, 41 percent of the jobs they had were seasonal while for those working over 90 percent of the time, only 22 percent of the jobs were seasonal. Sixth, those people who work less than 30 percent of the time, while on average are no younger than those working 30 to 90 percent of the time, tend to have spent an average about one year less out of a potential 8 years in the labour force. Compared to those working more than 90 percent of the time, the less than 30 percent group are significantly younger (about 4 years on average) and have about 1.75 years less labour force experience out of the eight years. Seventh, while those individuals working less than



30 percent of the time have experienced significantly longer average durations of unemployment than those working over 60 percent of the time, we find that of greater importance is the difference in their average duration of employment. The mean duration of employment is over 6 times, and the median duration almost 5 times as great for people who work over 90 percent of the time as compared to those who work less than 30 percent of the time.

When several of these factors are taken together and used to explain the proportion of time individuals are unemployed and employed, we find that age, skill, seasonality of the employment, frequency of recalls, and wage rates are statistically significant at a high level of confidence. When taken together however, they still only explain a small fraction of the behaviour of the unemployed.

The principal conclusion that can be drawn from these results is that employment policies that target on unemployed individuals with specific socio-economic characteristics are unlikely to have a significant impact on reducing the number of workers suffering a high degree of unemployment over time in Canada. Even if we were to take nine such common socio-economic variables together and targeted a program according to these characteristics, it is unlikely that they would be able to identify those workers suffering the greatest amount of unemployment. In general, we find that the characteristics of employment such as the permanency of the job (duration of employment spell), the skill requirements of the job, the wages paid by the job and the degree of seasonality of the industry are of greater importance in determining the amount of unemployment experienced than are characteristics of the individual (age, sex, dependency status).

The results would tend to point designers of employment policies away from the development of targeted employment programs toward those general incentives and pricing policies that would discourage people from choosing to be unemployed or firms from laying off workers. At the same time, policies should be designed that would encourage the creation of jobs that offer long durations of employment for the workers hired while discouraging the proliferation of seasonal, low-skilled and low-paying jobs that tend to coexist with large amounts of unemployed time.

#### FOOTNOTES

1. Denton et al. (1976), Feldstein (1975), Hall (1970), Hill and Corcoran (1979), Lazar (1977), McIlveen and Sims (1978), Perry (1972) are examples of such studies.
2. Most previous studies have been severely limited by the structure of the data available in coming to any strong conclusions about the unemployment and employment behaviour of individuals in the long run or over any extended time span. In general, the data used has been cross-sectional and often expressed in terms of aggregate or average statistics or has had at most one or two years of disaggregated data on the experience of individuals. In this study, we are able to track the behavior of individual workers over extended periods (up to eight years), and hence, estimate proportion of time employed  $P_i$  by each individual while in the labour force. Obviously,  $P_i$  is related to individual unemployment rates  $(1-P_i)$ , turnover rates  $(T_i)$  and unemployment durations  $(D_i)$  by  $(1-P_i) = T_i D_i$ , i.e., exactly the same relationship for aggregate data.
3. The sampling fractions for the regions for which results are given in this paper are: Canada, 1/1000; Newfoundland, 1/150; N.E. New Brunswick, 1/50; Halifax, 1/50; Montreal, 1/400; Toronto, 1/400; Oshawa, 1/80; Winnipeg, 1/50; and Vancouver, 1/250. Each sample contains between 1,000 and 2,000 individuals except for the Canadian sample which has over 6,000.
4. The age distribution of each proportion-of-time-employed group is similar. It is skewed to the right (more younger workers than older ones) with a skewness coefficient of approximately unity and a standard deviation of about 12 years.



5. Department of Manpower and Immigration (1971), Dictionary of Occupation (Ottawa, Department of Supply and Services).
6. Median durations are used here rather than means for two reasons. First, given the skewed distributions of unemployment and employment, it is a better representation of a typical spell length. Second, these data on the lengths of spells are for completed spells which would exclude the long spells, particularly of employment, that would not be completed as of the end of the data, and hence, the mean spell lengths would be biased downwards. This is not a problem with the median lengths.
7. This same regression was also run for samples of individuals all chosen from specific regional labour markets in Canada. The pattern of the results were similar to the Canada-wide sample. However, in the slow growth regions, the variables such as seasonality (RSEAS) and wage rates (MAXW) became relatively more important in explaining the variability of EMIND across workers in these regions than they were in the Canada-wide regressions.

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